

### REMARKS

Claims 1-41 are pending in this application. After claim additions, amendments and cancellations herein, claims 1-61 will be pending in this application.

#### 35 U.S.C. § 112 Rejections

In the May 13, 2004, 2004 Office Action, the Examiner objected to the heading of the claims section and to the extra period in claim 32, and Applicant has made the appropriate corrections in response. The Examiner also rejected amended claims 15 and 17-20 under 35 U.S.C. § 112 because there is insufficient antecedent basis for the limitation “the key” in claim 15, and Applicant has amended these claims in response by changing “the key” in claim 15 to “a key”. Applicant believes that these amendments to claims 15 and 32 overcome the Examiner’s rejections of claims 15, 17-20 and 32.

#### 35 U.S.C. § 103 Rejections

The Examiner has made the following rejections of the claims under 35 U.S.C. § 103(a):

- claims 1, 2, 6, 26, 32 and 41 as being obvious over Paetsch German Patent No. DE 1962931 in view of U.S. Patent No. 4,993,068 (Piosenka et al.);
- claims 3, 7, 27, 29 and 30 as being obvious over Paetsch in view of Piosenka and further in view of U.S. Patent Application Publication No. 20010018660 (Sehr);
- claims 4, 5, 8-17 and 33-37 as being obvious over Paetsch in view of Piosenka and further in view of U.S. Patent No. 5,712,912 (Tomko et al.);
- claims 18 and 19 as being obvious over Paetsch in view of Piosenka and Tomko et al. and further in view of Sehr;
- claim 20 as being obvious over Paetsch in view of Piosenka, Tomko et al. and Sehr and further in view of U.S. Patent No. 6,085,976 (Sehr 2);
- claim 21 as being obvious over Paetsch in view of Piosenka, Tomko et al., Sehr and further in view of U.S. Patent No. 6,615,194 (Deutsch et al.);
- claims 22-25 as being obvious over Paetsch in view of Piosenka and Tomko et al. and further in view of U.S. Patent No. 5,790,668 (Tomko);
- claim 28 as being obvious over Paetsch in view of Piosenka and further in view of U.S. Patent No. 5,991,811 (Ueno et al.);

- claim 31 as being obvious over Paetsch in view of Piosenka and Tomko et al. and further in view of U.S. Patent No. 6,009,177 (Sudia et al.);
- claims 38 and 39 as being obvious over Paetsch in view of Tomko et al.; and
- claim 40 as being obvious over Paetsch in view of Tomko et al. and further in view of Sehr 2.

Applicant traverses the Examiner's rejections. Applicant's invention is directed to the issuance of a certificate that comprises the genetic information identifying an animal or organism or biological material of an animal or organism, e.g., a genetic fingerprint, and the public key of an asymmetric key pair, whose corresponding private key is kept at a certification agency. The certificate comprises a hash value of information comprising the genetic information, which hash value is encrypted with the private key. By decoding the hash value with the public key and comparing this value with the hash value that one can obtain from the corresponding data on the certificate, one can be assured that the content of the data on the certificate was not altered. This certificate is analogous to a certificate that is issued by a trust center for digital signatures by humans. However, the important difference between this certificate and a certificate issued by a trust center for digital signatures is that the animal, organism or biological material of an animal or organism has no "digital signature" -- instead, the genetic code of the animal, organism or biological material takes the place of the human's digital signature in the certificate.

In one preferred embodiment, the key that is used to encrypt the hash value is specific for each individual animal, organism or biological material. It is desirable to maintain such a certification agency and to provide a central data base for data related to the animals, organisms or biological material. In order to access this data base, there may be a chip card or access code that is specific to each animal, organism or biological material. In certain embodiments, the information on the chip card or the access code is derived from the genetic information.

Applicant's invention is significant in that it applies not only to identification of a living animal or organism, but also to identification of parts or biological material of an animal or organism, such as meat produced from an animal. With Bovine Spongiform Encephalopathy (BSE) and other animal diseases causing public concern and with a great deal of semi-legal or

also illegal tampering of accompanying documents taking place, it is of great value to have means to trace a certain piece of meat back to a specific animal and possibly also to trace that specific animal back to specific ancestors. Similarly, in the field of animal trading, which is especially of interest to breeding institutions, the trust center established by this invention makes it possible to provide documentation on an animal that, as opposed to paper documentation, can unambiguously be related to a specific animal.

By contrast, the primary reference, Paetsch, discloses only storing biological data in a chip that is permanently attached to the animal in order to identify that animal during its lifetime. However, Applicant notes that biological data is not identical to genetic information. Biological data as referred to by Paetsch are the age, the pedigree, the medical history, etc. (see Paetsch, at paragraph 3), none of which has an unambiguous relation to genetic information of the animal. It is clear that these data cannot unambiguously identify an animal and most certainly cannot identify parts or other biological material of an animal, as Paetsch is concerned with identification only of the living animal itself.

With respect to amended claims 1, 32 and 41, Paetsch does not disclose providing any genetic information that unambiguously identifies an animal, organism or biological material, nor does it disclose storing or creating of identification data that have an unambiguous and predetermined verifiable relation to the genetic information. In fact, Paetsch does not mention or otherwise refer to genetic information or any other information unambiguously identifying an animal, organism or biological material of an animal or organism. The biological data that are stored in Paetsch, namely age, pedigree (descent) and medical history, do not have an unambiguous and predetermined relation to genetic information. There is no unambiguous and predetermined verifiable relation between genetic information, i.e., the DNA, on the one hand and the purely biological data or physical traits referred to in Paetsch on the other hand.

Paetsch also does not disclose that the data carrier that stores the identification data is not necessarily attached to the animal, organism or biological material. In Paetsch, the biological data is stored in a chip that is permanently attached to the animal, such as to its ear, and travels with it its entire lifetime. By contrast, the data carrier as claimed in amended claims 1, 32 and 41

is not necessarily attached to the animal, organism or biological material, i.e., it could be attached, could be separate or could be separably attached to the animal, organism or biological material. Thus, the data carrier can serve as an independent identification of the animal, organism or biological material irrespective of the physical presence of the animal, organism or biological material.

Paetsch further does not disclose the step of verifying the identification data in amended claim 1, i.e., establishing that the identification data have said predetermined verifiable relation to the genetic information. In order to establish this verifying step, it is necessary to have genetic information of the animal, organism or biological material to be identified and to establish whether the identification data that were stored have the predetermined connection or relation to these genetic data. This way it can be established that the identification data are indeed those relating to the animal, organism or biological material at issue. In fact, Paetsch is not concerned with verifying that the stored data relate to one specific animal, as the storage medium is fastened to the animal, e.g., by way of an earmark or an implanted chip (see Paetsch, last paragraph of the specification and amended claim 1), and thus no verification is necessary.

Similarly, the Piosenka reference also does not disclose providing genetic data unambiguously identifying an animal, organism or biological material of an animal or organism, nor does it disclose the use of identification data that have an unambiguous predetermined verifiable relation to such genetic information. Piosenka also does not disclose the step of verifying whether identification data are in a certain relation to genetic information unambiguously identifying an animal, organism or biological material.

Instead, Piosenka discloses an access control system for humans, wherein immutable physical traits, such as facial photograph, retinal scan, fingerprints (handprints), voice pattern and static or dynamic personal signatures, are encrypted (see Piosenka at column 3, lines 44-48, column 8, lines 39-47, column 9, lines 40-50, and column 11, lines 24-41). Piosenka generally refers to biometric sensors and biometric data, and does not disclose the use of genetic information. At an identification site, these physical, or biometric, data are decrypted and compared to the data that are taken from an individual identifying himself at the identification

site. It is clear from the context of Piosenka that these physical traits must be of a nature that can be readily obtained or measured from the individual at an identification site. Obviously, physical features that take a longer time to analyze, such as genetic data, are not contemplated and would not be suitable in the context of Piosenka.

The identification data proposed in Piosenka also do not have an unambiguous and predetermined verifiable relation to genetic information. The term “unambiguous and predetermined verifiable relation”, in a mathematical sense, means that the identification data are identical to or can be derived from the genetic information and/or vice versa, and can be verified as such. There is no unambiguous and predetermined verifiable relationship between genetic information, i.e., the DNA, on the one hand and the physical traits referred to in Piosenka, such as facial features, a voice pattern or static or dynamic signatures, on the other hand. It should be noted that even twins who are genetically identical do not have the same fingerprints or the same retinal pattern. In any case, even if fingerprints etc. had an unambiguous relation to genetic information, this relation would not be verifiable.

Applicant argues that the Paetsch and Piosenka references are not properly combinable to reject the claims, since, at the time of the invention, one skilled in the art of verification of data related to animals such as Paetsch would not consider a reference such as Piosenka that relates to access control for humans. The distinction between Paetsch and Piosenka could be described as the distinction between object identification, which is used to keep track of articles or other objects (or animals, in Paetsch), and subject identification, which is used to authorize a subject to perform a certain act (humans, in Piosenka). The authenticity of data relating to animals is usually established by having the data fastened to the animals, e.g., by way of an earmark as in Paetsch, or by providing the data in an immutable manner on the animal, e.g., by a brand or a tattoo, and this is similar to the handling of non-living objects. By contrast, identification of humans for the purpose of access control takes place at an identification site where stored physical or biometric data are compared to the data taken from an individual identifying himself at the identification site. One in the field of animal identification would not consult a system where physical traits must be measured from the individual at an identification site.

In addition, the Examiner's conclusion that an "identification method [that] applies to human beings can very well be used for animals and biometric information is directly in connection with genetic information, which is well known in the art" is incorrect. Applicant strenuously disagrees with the Examiner's conclusion, since the reference in Paetsch to physically immutable identification credentials, which are essentially physical characteristics, and the reference in Piosenka to the use of "biometric data", do not teach or even suggest the use of genetic identifying information. Neither is related to genetic data, and genetic data are not contemplated in either context. Applicant respectfully requests that the Examiner provide evidence that this is well known in the art or withdraw this statement.

Applicant also disagrees with the Examiner's statement that "biometric information is directly in connection with genetic information", as stated by the Examiner. First of all, it is simply not possible to conclude genetic data from physical features, such as fingerprints, and vice versa. The amended claims require that the relation between the identification data and the genetic data be verifiable in order for the verifying step to be performed, and it is not necessarily true that any such relation can be verified. Furthermore, it is not true that this was "well known in the art" at the time that the invention was made, and Applicant asserts that it is currently not possible to instantly genetically identify an animal, organism or biological material.

The authenticity of data relating to animals is usually established by having the data fastened to the animals, e.g., by way of an earmark as in Paetsch, or by providing the data in an immutable manner on the animal, e.g., by a brand or a tattoo, and this is similar to the handling of non-living objects. There had been no disclosure even considering going beyond this prior to Applicant's invention, and this is especially clear in view of the fact that the claims require "genetic material unambiguously identifying an animal, an organism or the biological material". Biological material could, for example, be a piece of meat of an animal or organism, or even embryos, sperm cells, egg cells or any other biological material of an animal or organism. The cited Paetsch and Piosenka references refer to identification of animals or humans, not to identification of parts of animals or organisms and not to identification of biological material from animals or organisms, neither of which was disclosed nor suggested in the prior art.

Accordingly, amended claims 1, 2, 6, 26, 32 and 41 are not obvious in view of Paetsch in view of Piosenka, and Applicant requests that the Examiner withdraw these rejections.

Applicant further traverses the Examiner's rejection of claim 4 and its dependent claims 5, 8-17 and 33-37 as being obvious over Paetsch in view of Piosenka and further in view of Tomko et al. The Examiner states that it would have been obvious to combine the teachings of Tomko within the combination of Paetsch-Piosenka because it is well known in the art to use PIN as an encrypting key to authenticate. As discussed above, amended independent claim 1 is not obvious in view of Paetsch in view of Piosenka, and thus claim 4 is also not obvious.

In addition, although Tomko discloses a smart card with biometric information identifying the user of a system and a PIN as an encrypting key, the Examiner's conclusion is incorrect, as the combination of these references would still provide only that biological or biometric data (not genetic information) encrypted using a PIN on a chip attached to an animal can authenticate the animal as a user of a system. It is also not obvious to encrypt the genetic identification data using a code that is specific for an individual animal or organism or individual biological material of an animal or organism, the code being generated in part based upon the genetic information of the animal or organism, as required in new claims 42 and 43, which are dependent upon claims 4 and 33, respectively. This is nowhere disclosed or suggested in any of the cited references.

Furthermore, the combination of references still does not make it obvious to provide a method as in these claims, since neither an animal, an organism nor biological material of an animal or organism can be a user of a system (at least not within the systems contemplated in Paetsch or Tomko). Paetsch and Tomko are thus in different fields, and their combination does not render claims 4, 5, 8-17 and 33-37 obvious. Applicant requests that the Examiner withdraw these rejections.

Applicant also traverses the Examiner's rejection of claims 38 and 39 as being obvious over Paetsch in view of Tomko. As discussed above, Paetsch discloses storing biological data, such as the animal's age, pedigree and medical history, but not its genetic information, in a chip

that is permanently attached to the animal in order to identify that animal during its lifetime. However, Paetsch does not disclose that the chip holds a key that has an unambiguous and predetermined verifiable relation to the genetic information of the animal, organism or biological material of the animal or organism, and Paetsch does not disclose that the chip carrier is not necessarily attached to the animal, organism or biological material, as required in amended claims 38 and 39.

The Examiner states that it would have been obvious to combine the teachings of Tomko within the system of Paetsch because it is well known in the art to authenticate a user before access is granted. However, although Tomko disclosed a smart card with biometric information identifying the user of a system, this does not cure the deficiencies of Paetsch, since the combination of references still does not have on the chip a key that has an unambiguous and predetermined verifiable relation to the genetic information of the animal, organism or biological material. In addition, the combination of references still does not make it obvious to use a chip carrier containing genetic information for identifying an animal, an organism or biological material of an animal or organism, since neither an animal, an organism nor biological material of an animal or organism can be a user of a system (at least not within the systems contemplated in Paetsch or Tomko). Paetsch and Tomko are thus in different fields, and their combination does not render amended claims 38 and 39 obvious. Applicant requests that the Examiner withdraw his rejection of these claims.

Accordingly, in view of Applicant's arguments above, Applicant respectfully argues that claims 1-41 as amended and new claims 42-43 are not obvious in view of the cited Paetsch and Piosenka references in combination with the other cited references.

#### New Claims

Applicant also adds new claims 44-58 relating to an electronic certificate for an animal or organism and a method for identifying an animal, an organism or biological material of an animal or organism by means of a certificate, as described in the specification, for example at page 2, line 36 - page 3, line 14 and at page 26, line 11 - page 27, line 10. Applicant respectfully

submits that new claims 44-58 are not anticipated or rendered obvious by any of the cited references of record and that these new claims are in condition for allowance.

### **Conclusion**

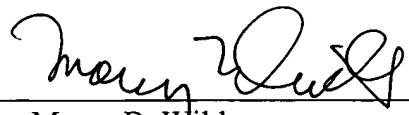
Reconsideration of the present application, as amended, is requested. In view of the above amendments and remarks, Applicant respectfully submits that amended claims 1-41 and new claims 42-55 are in condition for allowance. A Notice of Allowance is earnestly and respectfully sought.

If, upon review, the Examiner is unable to issue an immediate Notice of Allowance, the Examiner is respectfully requested to telephone Applicant's undersigned attorney in order to resolve any outstanding issues and advance the prosecution of the case.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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